OSPAR COMMISSION

Background Document for Spurdog or Spiny dogfish *Squalus acanthias*

Biodiversity Series

2010

OSPAR Convention

The Convention for the Protection of the Marine Environment of the North-East Atlantic (the “OSPAR Convention”) was opened for signature at the Ministerial Meeting of the former Oslo and Paris Commissions in Paris on 22 September 1992. The Convention entered into force on 25 March 1998. It has been ratified by Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, Netherlands, Norway, Portugal, Sweden, Switzerland and the United Kingdom and approved by the European Community and Spain.

Convention OSPAR

La Convention pour la protection du milieu marin de l'Atlantique du Nord-Est, dite Convention OSPAR, a été ouverte à la signature à la réunion ministérielle des anciennes Commissions d'Oslo et de Paris, à Paris le 22 septembre 1992. La Convention est entrée en vigueur le 25 mars 1998. La Convention a été ratifiée par l'Allemagne, la Belgique, le Danemark, la Finlande, la France, l’Irlande, l’Islande, le Luxembourg, la Norvège, les Pays-Bas, le Portugal, le Royaume-Uni de Grande Bretagne et d’Irlande du Nord, la Suède et la Suisse et approuvée par la Communauté européenne et l’Espagne.

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Executive Summary

This Background Document on the Spurdog *Squalus acanthias* has been developed by OSPAR following the inclusion of this species on the OSPAR List of threatened and/or declining species and habitats (OSPAR Agreement 2008-6). The document provides a compilation of the reviews and assessments that have been prepared concerning this species since the agreement to include it in the OSPAR List in 2008. The original evaluation used to justify the inclusion of *S.acanthias* in the OSPAR List is followed by an assessment of the most recent information on its status (distribution, population, condition) and key threats prepared during 2009-2010. Chapter 7 provides recommendations for the actions and measures that could be taken to improve the conservation status of the species. In agreeing to the publication of this document, Contracting Parties have indicated the need to further review these proposals. Publication of this background document does not, therefore, imply any formal endorsement of these proposals by the OSPAR Commission. On the basis of the further review of these proposals, OSPAR will continue its work to ensure the protection of *S.acanthias*, where necessary in cooperation with other competent organisations. This background document may be updated to reflect further developments or further information on the status of the species which becomes available.

Récapitulatif

Le présent document de fond sur l'*Aiguillat commun* a été élaboré par OSPAR à la suite de l'inclusion de cette espèce dans la liste OSPAR des espèces et habitats menacés et/ou en déclin (Accord OSPAR 2008-6). Ce document comporte une compilation des revues et des évaluations concernant cette espèce qui ont été préparées depuis qu'il a été convenu de l'inclure dans la Liste OSPAR en 2008. L'évaluation d'origine permettant de justifier l'inclusion de l'*Aiguillat commun* dans la Liste OSPAR est suivie d'une évaluation des informations les plus récentes sur son statut (distribution, population, condition) et des menaces clés, préparée en 2009-2010. Le chapitre 7 fournit des propositions d'actions et de mesures qui pourraient être prises afin d'améliorer l'état de conservation de l'espèce. En se mettant d'accord sur la publication de ce document, les Parties contractantes ont indiqué la nécessité de réviser de nouveau ces propositions. La publication de ce document ne signifie pas, par conséquent que la Commission OSPAR entérine ces propositions de manière formelle. A partir de la nouvelle révision de ces propositions, OSPAR poursuivra ses travaux afin de s'assurer de la protection de l'*Aiguillat commun* le cas échéant avec la coopération d'autres organisations compétentes. Ce document de fond pourra être actualisé pour tenir compte de nouvelles avancées ou de nouvelles informations qui deviendront disponibles sur l'état de l'espèce.

1. Background information

Name of species

Spurdog, Spiny dogfish, or Piked dogfish (*Squalus acanthias*) **Linnaeus 1758**

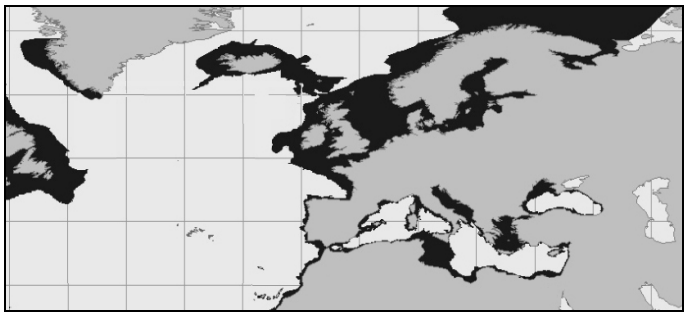
2. Original evaluation against the Texel-Faial selection criteria

List of OSPAR Regions and Dinter biogeographic zones where the species occurs

OSPAR Regions:	I, II, III, IV, V
Biogeographic Zones	Barents Sea, South Iceland-Faeroe Shelf, Finnmark subprovince, West Norwegian subprovince, Skagerrak subprovince, Boreal, Boreal-Lusitanean, Lusitanean-Boreal, Warm Lusitanean subprovince, Cool Lusitanean subprovince

Figure 1: Distribution of Spurdog *Squalus acanthias* in the OSPAR Area

Source: FAO 2003



List of OSPAR Regions where the species is under threat and/or in decline

All where it occurs.

Original evaluation against the Texel-Faial criteria for which the species was included on the OSPAR List

S. acanthias was nominated for inclusion in the OSPAR List in 2006 by both Germany and WWF

Table 1: Summary assessment of Spurdog (*Squalus acanthias*) against Texel-Faial criteria

Criterion	Comments	Evaluation
Global importance	Widely distributed globally	Does not qualify
Regional importance	A single Northeast Atlantic stock of Spurdog is distributed from the north of the Bay of Biscay to the Norwegian Sea. The OSPAR area is of regional importance for this stock, but not for the species as a whole.	Does not qualify
Rarity	Not rare.	Does not qualify
Sensitivity	Very sensitive to fisheries because of its very low intrinsic rate of increase. Is very slow to recover from depletion.	Qualifies
Keystone species	No information	Unknown
Decline	Severely declined to about 5% of its original population.	Qualifies

3. Current status of the species

Distribution in OSPAR Maritime Area

Squalus acanthias occurs in temperate and boreal waters along continental shelves and slopes. It is most common on or near the seabed in coastal waters. In the OSPAR Area, it occurs from Iceland and Murmansk south to Gibraltar (Figure 1) and undertakes seasonal migrations in at least part of this range. Elsewhere, it is found in the Mediterranean and Black Seas, South Atlantic, North and Southeast Pacific, New Zealand and Australia. Trans-Atlantic genetic exchange is very limited (Hammond and Ellis 2005).

Population (current/trends/future prospects)

S. acanthias is seriously depleted in the OSPAR Area and the stock may be in danger of collapse as a result of unsustainable removal in former target fisheries (ICES WGEF 2009). Although the majority of large-scale target fisheries collapsed several years ago, its aggregating habit made this valuable species highly vulnerable to localised, seasonal fisheries. Retention of by-catch from mixed fisheries

has also been unrestricted until recently. Several stock assessments for *S. acanthias* in the North-East Atlantic, including the OSPAR Area, have been undertaken during the past decade (e.g. Heesson 2003, Hammond and Ellis 2004, ICES WGEF 2006). These estimated very low stocks (between 100,000 and 500,000 mature individuals in 2000) of this formerly highly abundant species.

Continued target fishing and retention of bycatch since the above stock assessments will have reduced numbers still further. The North-East Atlantic population is listed as "Critically Endangered" in the IUCN Red List (Fordham *et al*. 2006). Recovery requires fishing pressure on this stock to be minimised.

Although almost all target fisheries are now closed and by-catch is regulated (see Section 5), the shortage of mature breeding females means that population recovery will be extremely slow and likely take many decades. For example, projected recovery models in the North-West Atlantic suggest that the spawning stock biomass will continue to decline for several years despite the adoption of a stock rebuilding plan. This is because only small numbers of new recruits will be entering the breeding stock to compensate for the natural mortality of the oldest females (ASMFC 2008). It is likely that similar patterns may occur in the North-East Atlantic population. ICES therefore also recommended, in 2008, "If a non-zero TAC would be set [...] the introduction of a maximum landing length [...] initially set at 100 cm [...] to deter fisheries targeting areas where large females occur". This was implemented in January 2009.

Condition (current/trends/future prospects)

In 2006, ICES warned: "the stock is depleted and may be in danger of collapse. Targeted fisheries should not be permitted to continue, and by-catch in mixed fisheries should be reduced to the lowest possible level. The TAC should cover all areas where spurdog are caught in the North-East Atlantic and should be set at zero". This advice has not changed since 2006 (ICES WGEF 2009). Survey data presented by ICES (2006) indicate that large mature females are less abundant than the smaller mature males. This is because the largest animals are more valuable and have been targeted more heavily, while smaller animals (males and immature) are more likely to be discarded. Large mature females are, therefore, not well represented in the population within the OSPAR Area and recruitment of pups is therefore likely also to be poor. As noted above, this has serious implications for rates of recruitment and stock recovery. It will be many decades following closure of fisheries before the *S. acanthias* population structure returns to a more natural condition.

Limitations in knowledge

S. acanthias is the best studied of elasmobranch species. Limitations in knowledge identified by the ICES Working Group on Elasmobranch Fishes (2008) include estimates of discards, discard mortality rates, some misreporting of catches, natural mortality rates, growth parameters and other biological data, and information on pupping and nursery grounds. By-catch survival rates for Spurdog and similar small benthic sharks appear to be fairly high (e.g. Mandelman and Farrington 2007a&b, Revill *et al*. 2005, Rulifson 2007), but additional studies in partnership with industry would confirm this and help to justify discard of by-catch that exceeds quota.

4. Evaluation of threats and impacts

Now that the majority of target fisheries are closed, by-catch mortality in inshore fisheries is the most significant threat to *S. acanthias*, which is taken by trawls, static (gill or tangle) nets, and hook and line (commercial and sports). This species is very vulnerable to capture in large numbers because of its aggregating nature.

Table 2: Summary of key threats and impacts to Spurdog (*Squalus acanthias*)

Type of impact	Cause of threat	Comment
Fisheries	Formerly target, now by-catch fisheries.	See above.
Habitat damage	Mobile fishing gears, pollution	Minor impact compared with mortality in fisheries.

5. Existing management measures

A total allowable catch (TAC) has been set for European Community waters of the North Sea and Norwegian Sea (ICES Areas IIa and IV) since 1999, but this was initially significantly higher than recent landings. It was subsequently reduced and may have become restrictive in 2005. In 2005, the ICES Advisory Committee on Fisheries Management recommended extending the TAC to cover the entire stock distribution area (ICES ACFM 2005). ICES further advised in 2006 that the TAC should cover all areas where Spurdog are caught in the North-East Atlantic and should be set at zero (ICES ACFM 2006). This advice has not changed since 2006 and is being phased in through much of the OSPAR Area.

In 2007, in the North Sea and Norwegian Sea (OSPAR Region II) the TAC was reduced significantly, target fisheries closed, and a 5 % by-catch limit established. A bycatch TAC was also introduced for other EC waters. These TACs have been reduced steadily since then with the aim of closing the fishery in 2010 (apart from a remaining by-catch TAC of 10 % of the 2009 TAC).

Council Regulation (EC) 43/2009, Annex III Part B states “Catches of Spurdog taken in absence of a quota or once the quota has been exhausted shall be promptly released unharmed to the extent practicable. Fishers shall be encouraged to develop and use techniques and equipment which, following consultation of STECF, serve to facilitate the rapid and safe release of the species.” Furthermore, the Regulation set a maximum landing size of 100 cm total length to protect the largest and most fecund mature females (females mature at ~80 cm and reach a maximum size of 120 cm).

European Council Regulation (EC) No. 1185/2003 *on the removal of fins of sharks on board vessels* prohibits the removal of shark fins and subsequent discarding of the body. This regulation is binding on EC vessels in all waters and non-EC vessels in Community waters.

Norway established a minimum landing size of 70 cm during the 1990s, intended to enable female dogfish to mature before capture. Since 2007, Norway has operated a general ban on fishing and landing of Spurdog in the Norwegian economic zone and in international waters, although by-catch must be landed. Small inshore vessels (less than 28 m long) are, however, allowed to fish for Spurdog with traditional gear inshore and in territorial waters. The fishery may be closed when catches reach the previous year’s level.
Sweden prohibited the use of nets and longlines for fishing for Spurdog in Swedish waters in 2008. Trawl fisheries may only take the species as a by-catch. Fisheries with hand-held gear have a bag limit of one Spurdog per fisher in each 24-hour period. Permits to target Spurdog may be granted to commercial fishers that have reported Spurdog catches of at least 2000 kg during either 2005 or 2006.

Table 3: Total Allowable Catches (TAC) and landings (tonnes) of Spurdog (*Squalus acanthias*) in the North-East Atlantic (* = by-catch quota)

	TAC (IIA(EC) & IV)	TAC I, IIIA,V, VI, VII, VIII, XII & XIV (EU & international waters)	Estimated Landings (NE Atlantic stock)
1999	8,870		
2000	8,870		
2001	8,870		12,547
2002	7,100		9,050
2003	5,640		10,132
2004	4,472		8,044
2005	1,136		6,592
2006	1,051		3,771
2007	841 *	2,828	2,501
2008	631 *	2,004 *	
2009	316 *	1,106 *	

The 2008 Annual Meeting of the North-East Atlantic Fisheries Commission (NEAFC) recognised the ICES advice regarding the depletion and danger of stock collapse of North-East Atlantic Spurdog and prohibited fisheries within the NEAFC Regulatory Area in 2009. While Spurdog is not known to be fished on the High Seas, Recommendation VIII also recommends that Contracting Parties to NEAFC take equivalent conservation measures within waters under their national jurisdiction (NEAFC 2008).

Measures already adopted in European waters and by European vessels may be further supplemented by management measures proposed under the European Community Action Plan for the Conservation and Management of Sharks (CPOA, EU COM(2009) 40 final), adopted in 2009. The CPOA sets out to rebuild depleted shark stocks fished by the Community fleet within and outside Community waters, and the Shark Assessment Report that accompanies the CPOA pays particular attention to *Squalus acanthias*. Measures outlined in the CPOA include the establishment of catch limits for shark stocks in conformity with advice provided by ICES and relevant RFMOs, release of live unwanted by-catch, increased selectivity of fishing gear, establishment of by-catch reduction programmes for Critically Endangered and Endangered shark species, and international cooperation in CMS and CITES with a view to controlling shark fishing and trading. These measures will be implemented at Community and Member State level and the Community will seek their endorsement by all relevant RFMOs.

Northern hemisphere stocks of Spurdog are listed in Appendix II of the Convention on the Conservation of Migratory Species (CMS). CMS is currently developing an instrument for the conservation of migratory sharks, which may in due course stimulate additional international conservation and management actions for this species.

6. Conclusion on overall status

This species is seriously depleted by fisheries throughout the OSPAR Maritime Area. Management is now being introduced in line with ICES advice and fishing pressure is falling significantly in several OSPAR Regions. Despite this improved management, the scarcity of large mature females will result in continued poor recruitment for many years and very slow population recovery. *S. acanthias* is listed in the IUCN Red List of Threatened Species as “Critically Endangered” in the North-East Atlantic.

7. Action to be taken by OSPAR

The conservation objectives for this species should be set according to ICES advice and NEAFC Recommendation VIII (2008), in order to enable the stock to recover. All target fisheries should not be permitted to continue; by-catch in mixed fisheries should be reduced to the lowest possible level (including through reductions in overall demersal fishing effort); and critical areas (particularly nursery grounds and aggregations of pregnant females) identified and protected. Action through OSPAR may, in particular, address the last of these objectives.

Action/measures that OSPAR could take, subject to OSPAR agreement

As set out in Article 4 of Annex V of the Convention, OSPAR has agreed that no programme or measure concerning a question relating to the management of fisheries shall be adopted under this Annex. However where the Commission considers that action is desirable in relation to such a question, it shall draw that question to the attention of the authority or international body competent for that question. Where action within the competence of the Commission is desirable to complement or support action by those authorities or bodies, the Commission shall endeavour to cooperate with them.

Scientific advice on the management of this species is available from ICES. This is being implemented, at least in part, by NEAFC, Norway and the European Union. OSPAR should endeavour to support the adoption of these management measures by its Contracting Parties and consider whether it may also contribute to the conservation of critical habitats for this species.

It is therefore proposed that OSPAR should encourage relevant Contracting Parties (Range States and those whose flag vessels are engaged in fisheries that capture *S. acanthias*) to adopt or support the adoption of ICES, European Commission and NEAFC advice for this species through, *inter alia*:

1. national, European and regional fisheries conservation and management measures, including provisions within the Community Plan of Action on Sharks and implementation of the 100 cm maximum landing size (possibly combined with a minimum landing size – a slot size);
2. the designation of marine protected areas for aggregations and nursery grounds; and
3. marine species and fisheries research.

Table 5: Summary of key priority actions and measures which could be taken for *S.acanthias*. Where relevant, the OSPAR Commission should draw the need for action in relation to questions of fisheries management to the attention of the competent authorities. Where action within the competence of the Commission is desirable to complement or support action by those authorities or bodies, the Commission shall endeavour to cooperate with them.

Key threats	Fisheries mortality (particularly by-catch) in unsustainable fisheries	
Other responsible authorities	EC and Council of Fisheries Ministers (Common Fisheries Policy, Regulations, TACs) NEAFC Contracting Parties OSPAR Contracting Parties ICES	
Already protected? Measures adequate?	EC Regulation No. 1185/2003 on the removal of shark fins on board fishing vessels	Impact unlikely to be significant, since *S. acanthias* fins are of low value compared with the valuable meat.

	NEAFC Recommendation VIII (2008)	Prohibition of fisheries within the NEAFC Regulatory Area (unlikely to reduce mortality of this shelf species)
	Total Allowable Catches and bycatch quotas	TACs are restrictive and due to be reduced to near-zero in 2010
	Minimum and maximum landing sizes	Maximum landing size should protect the largest, most fecund mature females. Minimum landing size may not influence landings to the same extent, since small animals are often discarded. A slot size has been applied successfully for the management of other fish species.
	Appendix II of CMS	A new listing. The Migratory Shark Instrument (Memorandum of Understanding and Action Plan) for listed species is not yet available, nor is there agreement whether this will apply to Spurdog.
	Effort regulation	Demersal fishing effort is increasingly regulated, which will reduce bycatch mortality
Recommended Actions and Measures	OSPAR Commission	Monitor information and advice of the ICES Working Group on Elasmobranch Fisheries and bring this to the attention of CPs.
	Contracting Parties	Adopt ICES advice. Support ICES and Commission recommendations in the Council of Ministers. Identify and protect critical habitats (for mature females and pups)
	Research needs	Life history and trend data; discard data and bycatch survival studies; natural mortality rates; growth parameters and other biological data; pupping and nursery grounds; modelling impact of maximum landing sizes upon stock recovery.

Brief summary of proposed monitoring system (see annex 2)

Fishery-independent surveys are already monitoring this species and landings are recorded, primarily at species level. More information is required on discards. Additional tagging and tracking surveys may contribute additional useful data.

Annex 1: Overview of data and information provided by Contracting Parties

Contracting Party	Feature occurs in CP's Maritime Area	Contribution made to the assessment (e.g. data or information provided)	National reports References or web links
Belgium	Y	N	
Denmark	Y	Y – Review of Draft	
France	Y	Y – Review of Draft	
Germany	Y	Y – Review of Draft	
Iceland	Y	N	
Ireland	Y	N	
Netherlands	Y	N	
Norway	Y	N	
Portugal	Y	N	
Spain	Y	Y – Review of Draft	See country-specific information
Sweden	Y	Y – Review of Draft	Fiskeriverkets föreskrifter (FIFS 2004:36) om fiske i Skagerrak, Kattegatt och Östersjön. Fiskeriverkets föreskrifter (FIFS 2007:38) om ändring i föreskrifterna (FIFS 2004:36) om fiske i Skagerrak, Kattegatt och Östersjön. Fiskeriverkets föreskrifter (FIFS 2008:35) om ändring i föreskrifterna (FIFS 2004:36) om fiske i Skagerrak, Kattegatt och Östersjön. Gärdenfors, U., 2005 (ed): Rödlistade arter i Sverige 2005. See country-specific information
United Kingdom	Y	Y – Review of Draft	

Summaries of country-specific information provided

Spain

Squalus acanthias (Spurdog) in the Cantabrian Sea: This species is distributed in Galicia and Cantabrian waters but is rarely caught in bottom trawl surveys. Landings come from the by catch of other fisheries. Galicia and Basque country fishing ports are the ones with some landings operating in ICES area IX a and VIII abd respectively. Landings in the Basque country from baka trawl fishery dropped from 32 t in 1994 to 0.7 in 2007 (ICES, WGEF 2008). Fishery statistics are reported to the ICES WGEF.

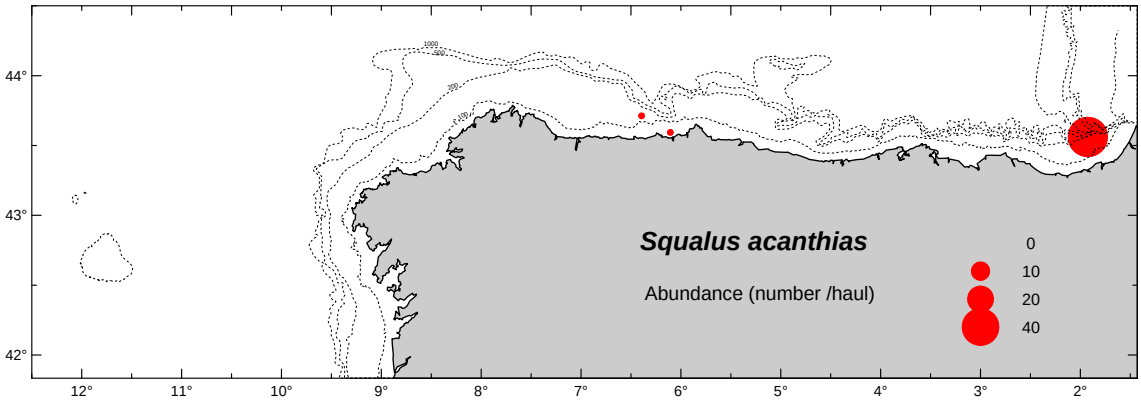


Figure 2: Geographical distribution of *Squalus acanthias* catches from bottom trawl surveys.

Sweden: Occurs regularly in Swedish waters.

A TAC was first introduced in 2007 outside zone IIa and IV. Zone IIIa is excluded from the TAC covering other OSPAR areas since 2008. No TAC-limit was set for IIIa in 2008, but Sweden in general banned fishing with 10 special permits issued to the fishing industry.

2009: Sweden's quota is 73 tonnes in zone IIIa. None of the quota is allocated for bycatch, but individuals larger than 100 cm have to be released. Nets and longlines are banned and the species may only be caught as bycatch in trawls. In recreational fishing only one individual per person and day may be caught. Special permits for the fishing industry can be issued though.

The species is listed as EN on the Swedish red list (IUCN) (Gärdenfors 2005).

Annex 2: Detailed description of the proposed monitoring and assessment strategy

Rationale for the proposed monitoring

Continued monitoring is essential to provide management advice and to evaluate future trends, including bycatch and stock recovery following cessation of target fisheries.

Use of existing monitoring programmes

Regular fishery independent surveys are undertaken by research vessels and chartered vessels in the OSPAR Area and landings data are collected at species level. The ICES Working Group on Elasmobranch Fishes uses these and all other available sources to report regularly on the status of this species in the OSPAR Area.

Synergies with monitoring of other species or habitats

Monitoring of other demersal fish species on the OSPAR list require the same strategy.

Assessment criteria

It is not considered necessary to develop assessment criteria or triggers for additional monitoring of this species at the present time.

Techniques/approaches

As already underway, with the addition of improved discard reporting, discard survival studies in collaboration with industry, collection of additional biological data, and possibly tagging and tracking studies.

Selection of monitoring locations

Should include critical areas (e.g. pupping and nursery grounds), once identified.

Timing and Frequency of monitoring

As already underway.

Data collection and reporting

As already undertaken with improvements as required.

Quality assurance

n/a

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OSPAR COMMISSION

New Court
48 Carey Street
London WC2A 2JQ
United Kingdom

t: +44 (0)20 7430 5200
f: +44 (0)20 7430 5225
e: secretariat@ospar.org
www.ospar.org

OSPAR's vision is of a clean, healthy and biologically diverse North-East Atlantic used sustainably

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